

Two decades of Antarctic coastal-change revealed by satellite imagery and deep learning

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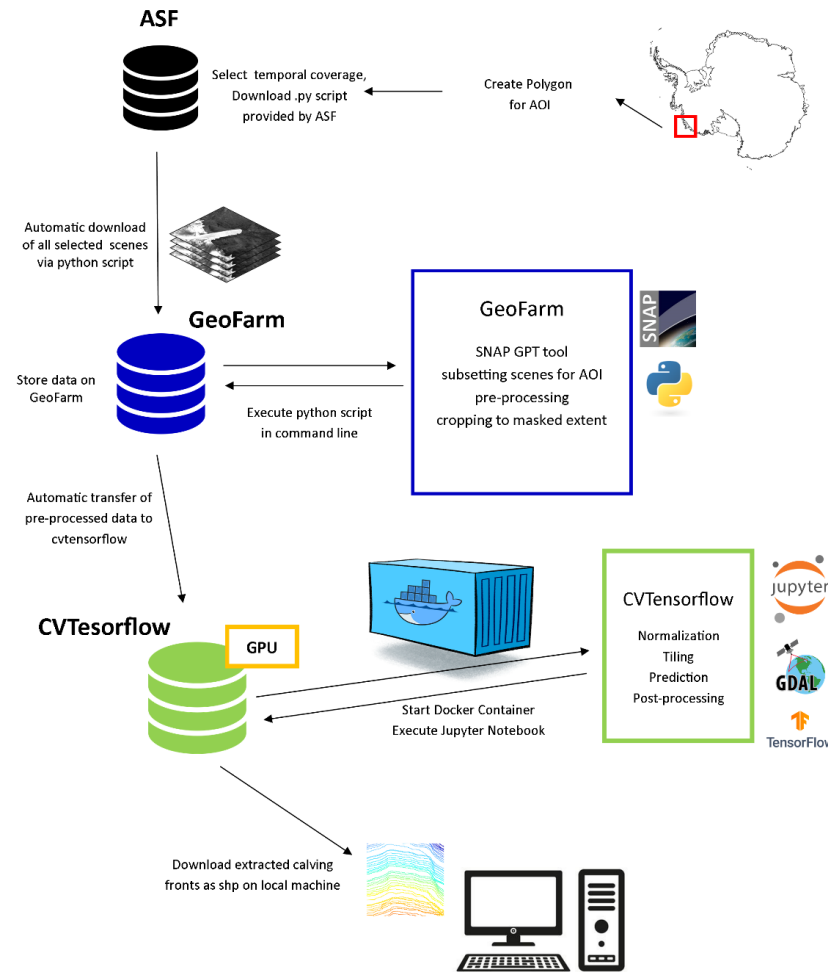
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[Link to publication](#)

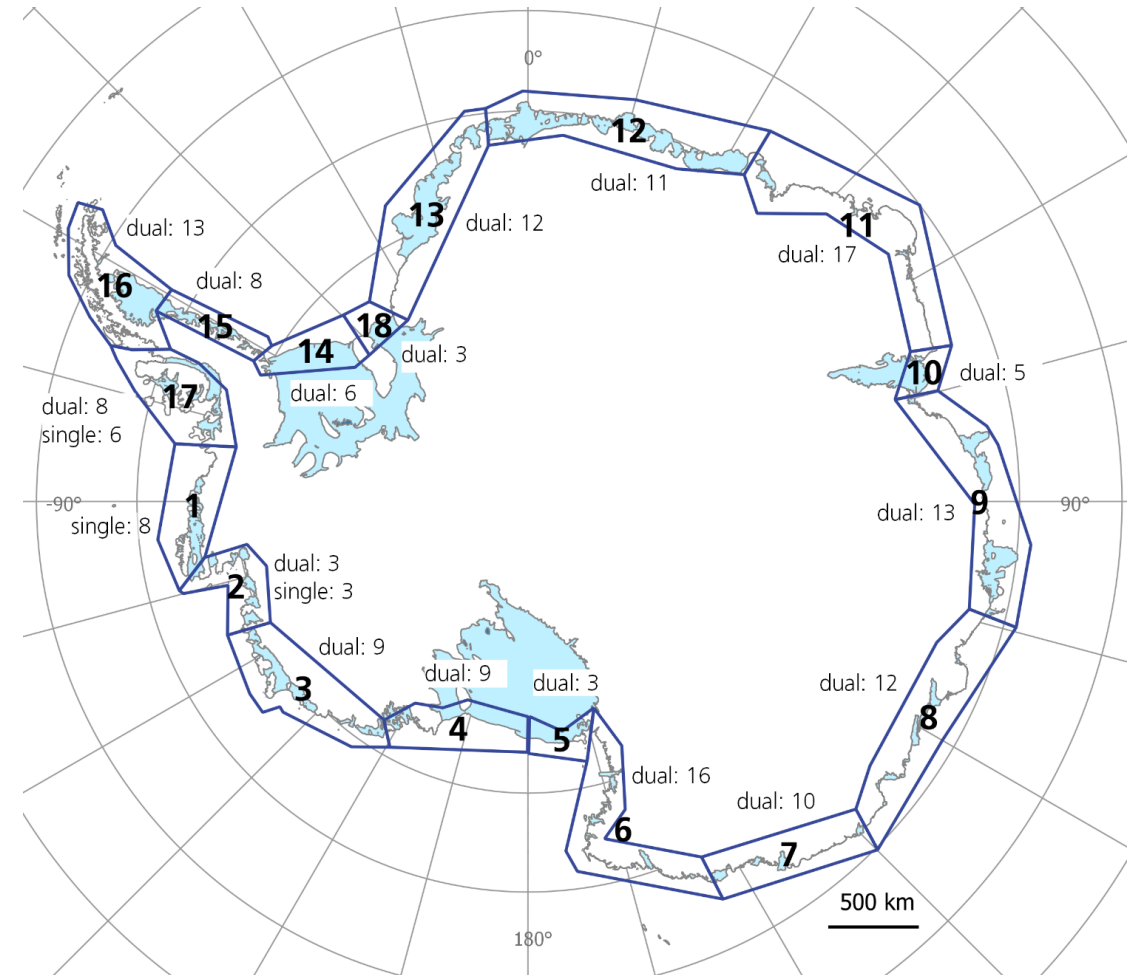


Antarctic Coastline Extraction

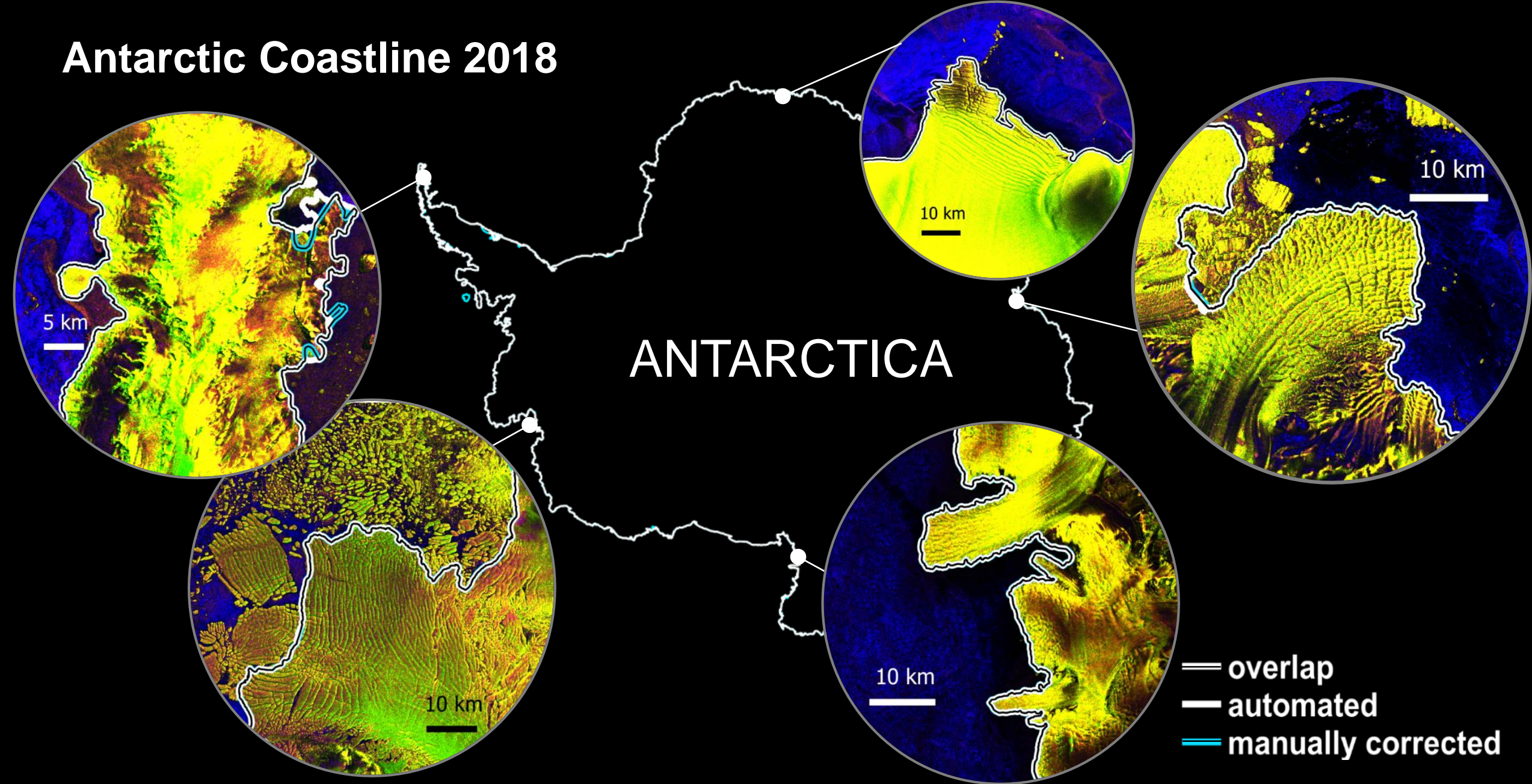
Implemented Processing Chain



Sentinel-1 Data Coverage in total **175 Scenes**



Antarctic Coastline 2018



Calculating Coastal-Change



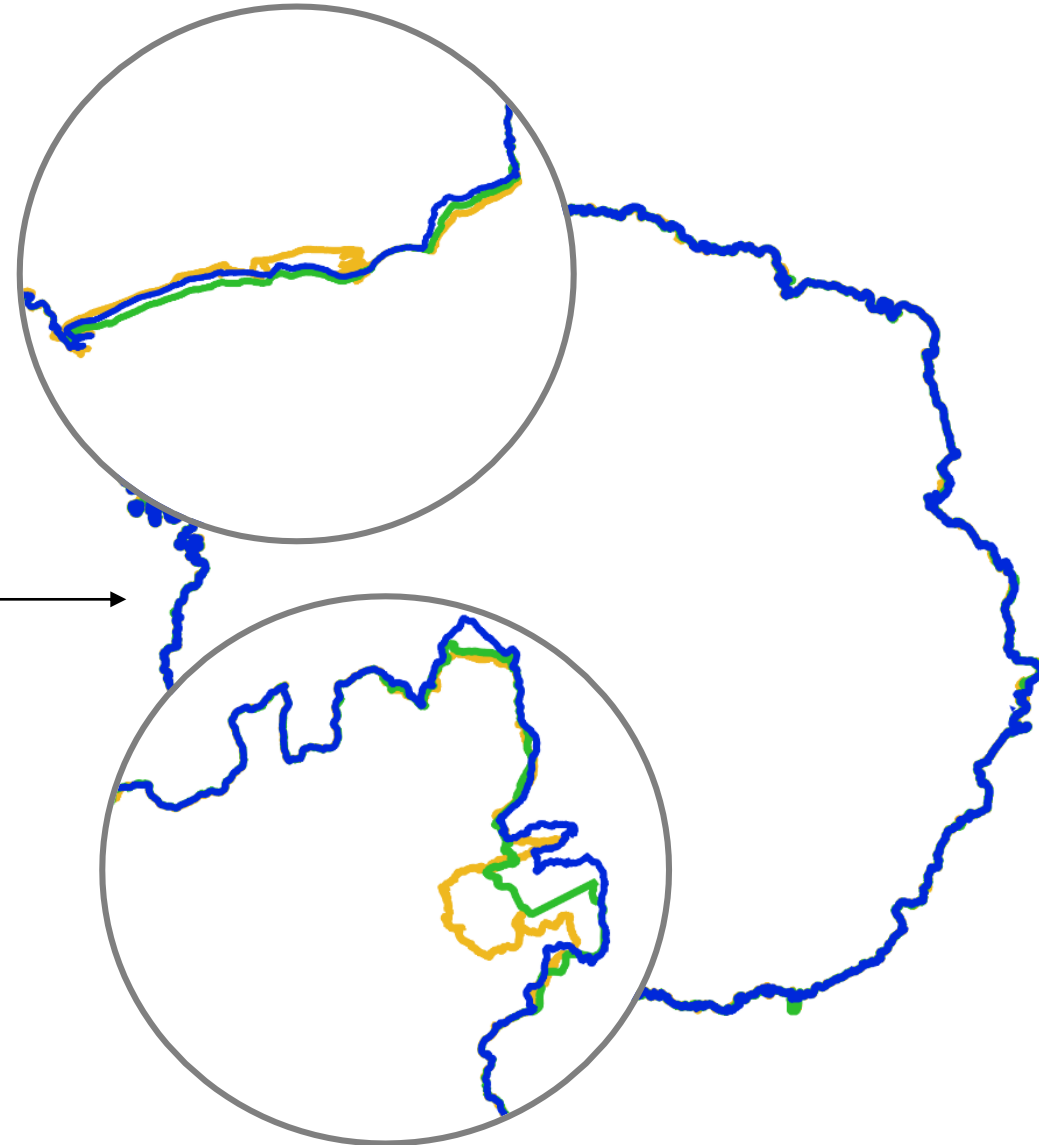
1997 Radarsat

2009 MODIS

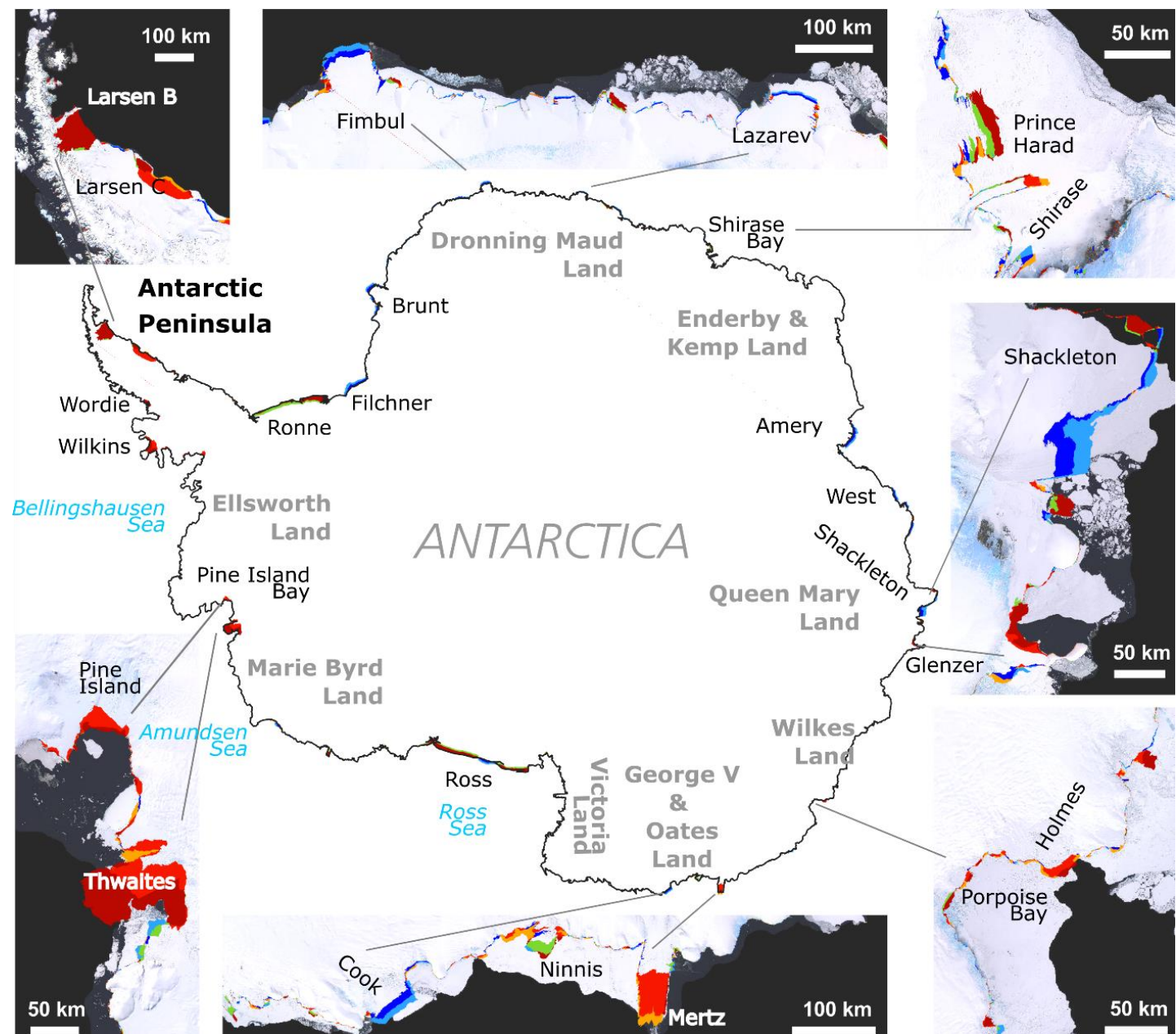
2018 Sentinel-1



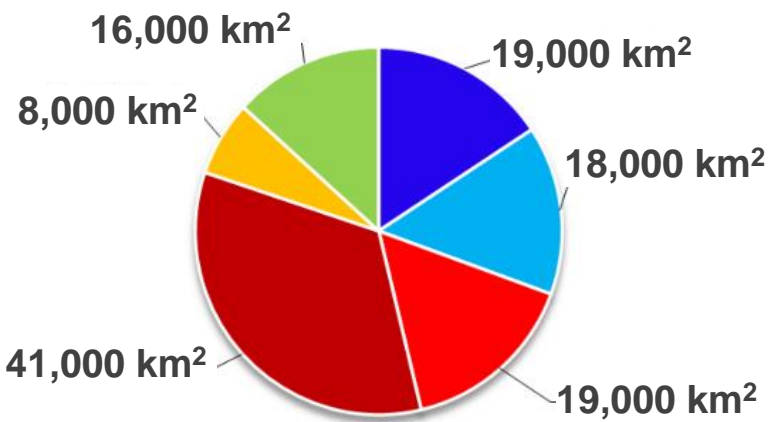
manual editing:
remove
differences due to
errors and
subjectivity



Two Decades of Coastal-Change



Circum-Antarctic Coastal-Change 1997-2018 in km²



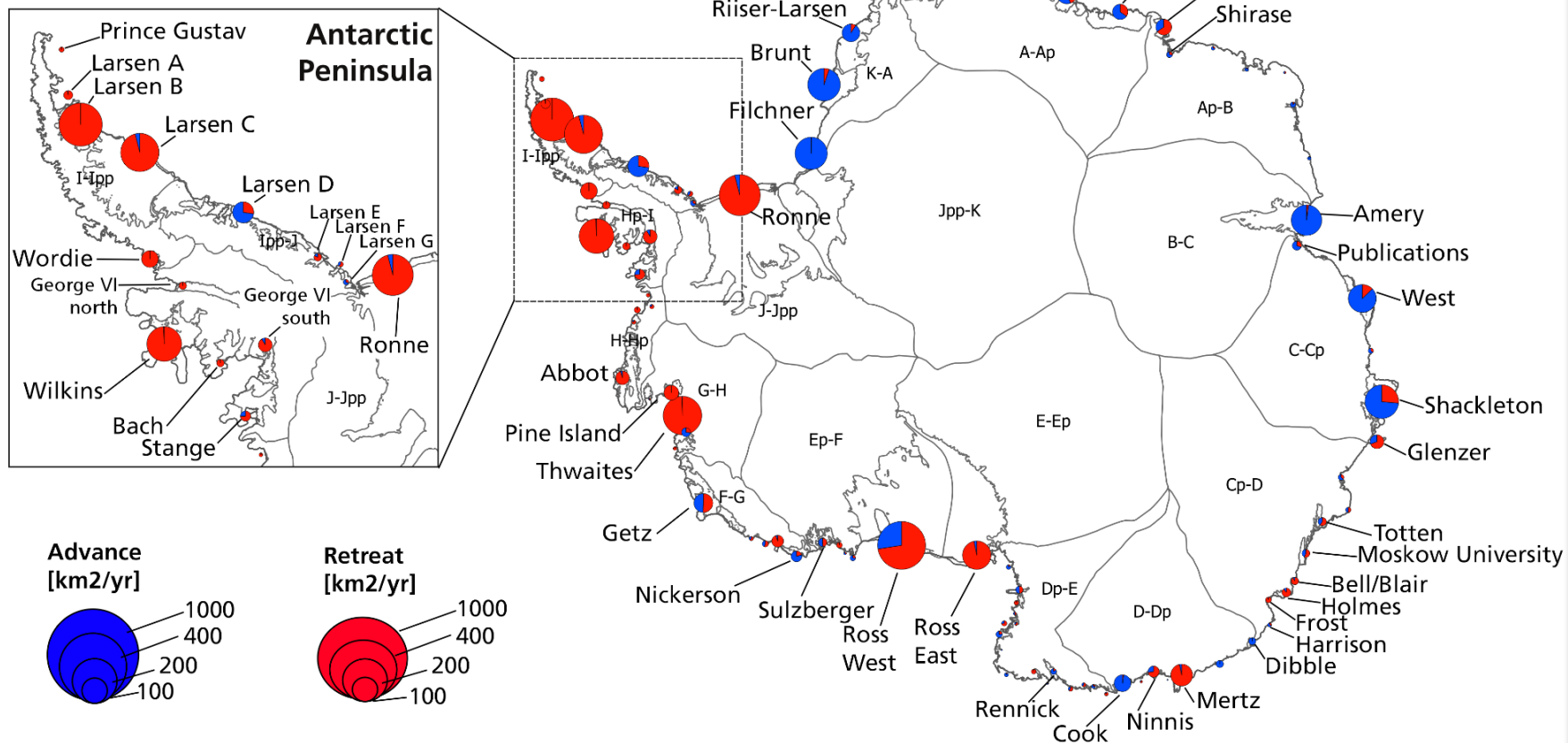
Legend

- Retreat since 1997
- Retreat since 2009
- Advance since 2009
- Advance since 1997
- Re-Advance since 2009
- Advance until 2009

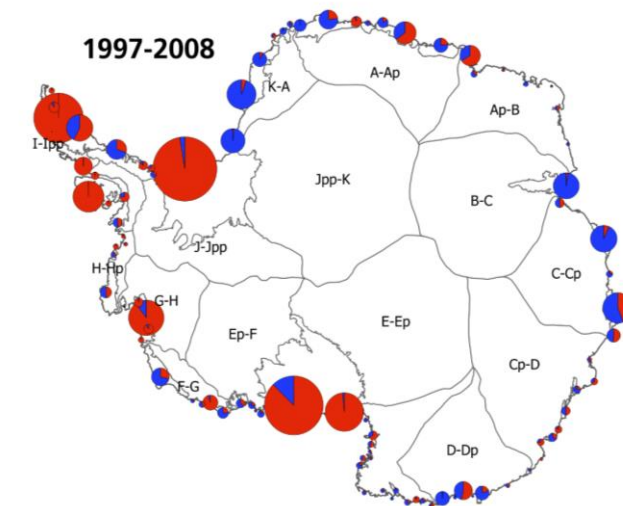
Baumhoer et al. 2021, edited

Glacier and Ice Shelf Front Change

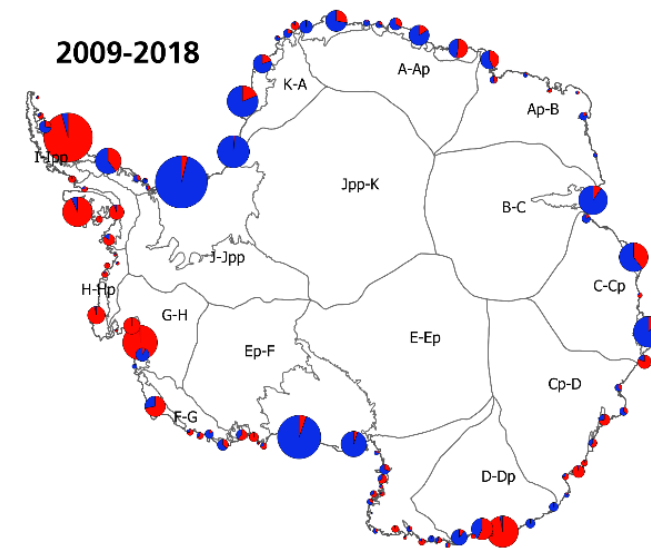
1997-2018



1997-2008



2009-2018



1. Decade (1997-2008): retreat **-29,618 ± 1,193 km²**
2. Decade (2009-2018): advance **7,108 ± 1,029 km²**

Baumhoer et al. 2021, edited

A satellite image of the Brunt Ice Shelf, showing a large, irregularly shaped ice mass. The ice shelf is outlined in white, indicating the extracted coastline. The surrounding ocean is depicted with a color-coded bathymetry overlay, ranging from dark blue (deep) to yellow (shallow). The ice shelf itself is a mix of dark blue and purple, with some yellow and orange patches. The text "Thank you for your interest!" is centered over the image in a white, italicized font.

Thank you for your interest!

Calving at Brunt Ice Shelf (iceberg A-74)
extracted coastline in white
26. Februar 2021
© Copernicus Sentinel-1 Data

References

Baumhoer, C. A., Dietz, A. J., Kneisel, C., Paeth, H., & Kuenzer, C. (accepted). Environmental Drivers of Circum-Antarctic Glacier and Ice Shelf Front Retreat over the Last Two Decades. *The Cryosphere*.

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<https://ai-core.eoc.dlr.de/>